Laboratory for Data Technologies

University of Ljubljana,

Faculty of Computer and Information Science

Ljubljana, 4.11.2011

Laboratory for Data Technologies (LPT)

- Part of Informatics Group, Faculty of Computer and Information Science (founded in 2008).

- Currently 12 members (head prof. Marko Bajec):

Marko Bajec, PhD	Aljaž Zrnec, PhD	Štefan Furlan	Lovro Šubelj	Aleš Kumer	Bojan Klemenc
Associate Professor, Head	Senior-Lecturer	Junior researcher	Junior researcher	Assistant-Lecturer	Assistant-Lecturer

Dejan Lavbič, PhD	Slavko Žitnik	Neli Blagus	Milan Pevec	Jernej Korošec	Kaja Vidmar
teaching assistant	Junior researcher	Junior researcher	Researcher	Researcher	Researcher

- Lectures on databases, information systems etc.

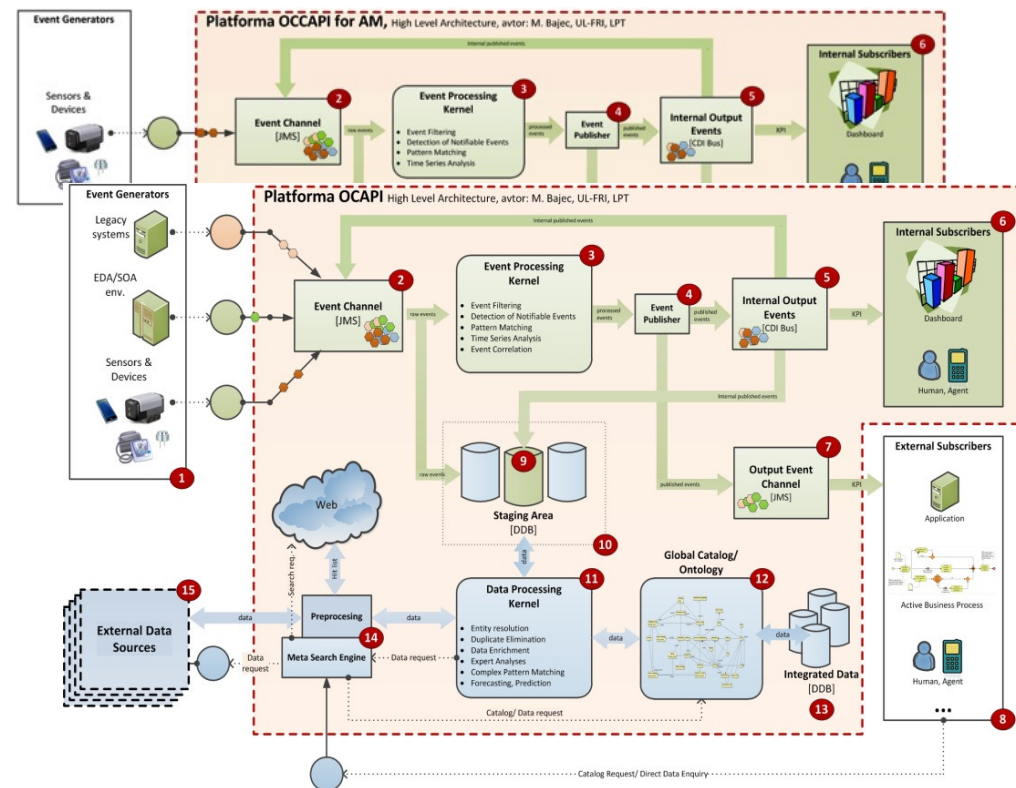# Projects

On-going projects

- Two on-going projects ("Kompetencni Centri"):
  - KC-OPCOMM – intelligent application platform;
  - KC-CLASS – cloud computing.

www.purevpn.com (2011)

Past projects

- Some past projects:
  - prototype architecture for fraud detection systems;
    (project VALOR, Optilab d.o.o., 2009)
  - prototype billing system for electrical-energy systems;
    (project for industry, Optilab d.o.o., 2009 - 2011)
  - specifications for a billing system for electrical-distribution companies in Slovenia.
    (project for industry, Informatika d.d., 2008 – 2009)

- Some partners:
  - LTFE;
  - Iskratel;
  - Špica Int.;
  - MP;
  - DARS;
  - DRSC;
  - PKP;
  - KC-TIGER;
  - KC-STV;
  - Infotehna ;
  - Telekom;
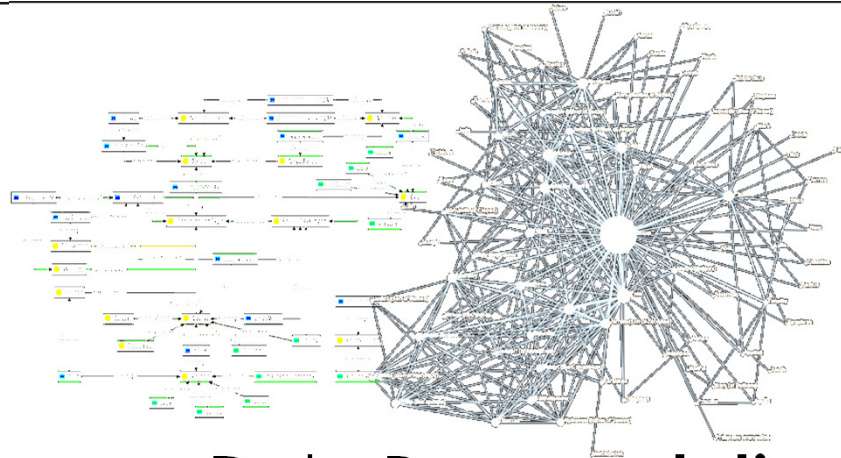 - Mobitel;
  - NLB;
  - other.

Starting projects

- Some *future* research-oriented projects:
  - Supervisor+ – "socio leaks" [sub. IJU '11];
  - WhoKnowsWho – social relations;
  - TellMeMore – dynamic web mining;
  - iCORE & IOBIE – inform. retrieval [IJU '10];
  - TrafficSim – traffic simulation & analysis;
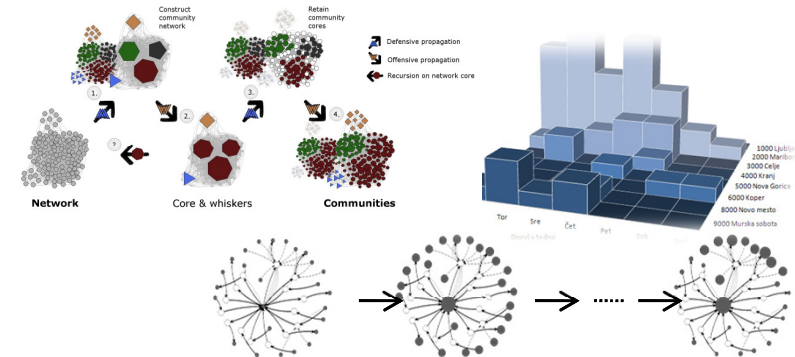 - VisSonCon – 3D visualization,
    soundification & control.

University of Sydney
(Seok-Hee Hong)
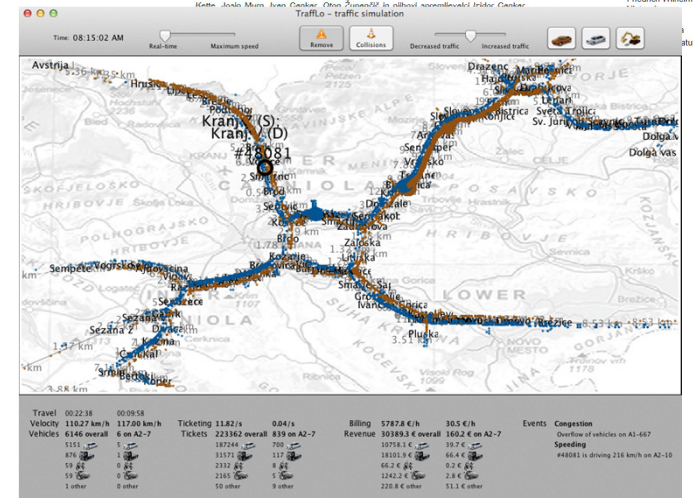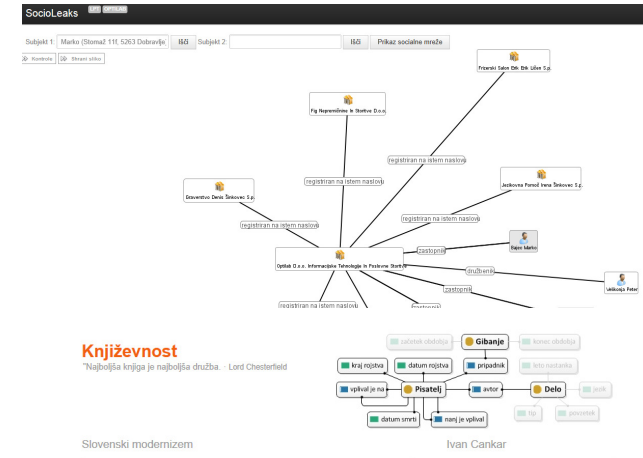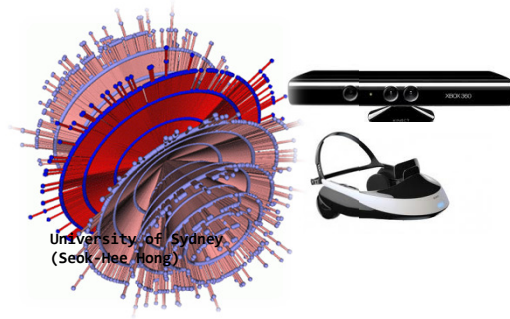
Research

Data **Representation**
Relations, ontologies, graphs & networks, web & text data, XML, data streams, etc.
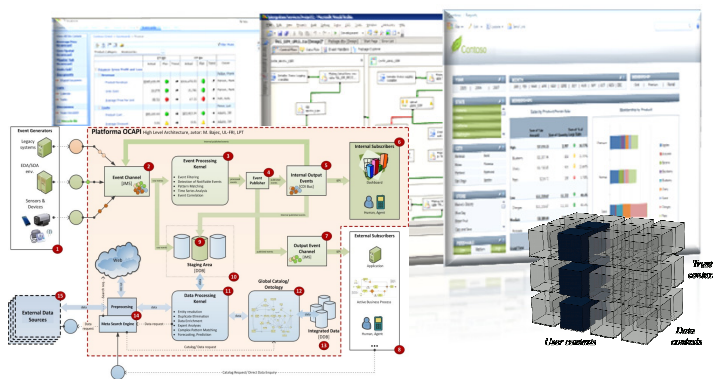
Data **Analysis**
Information retrieval & extraction, network analysis & mining, data mining & knowl. discovery, real-time etc.
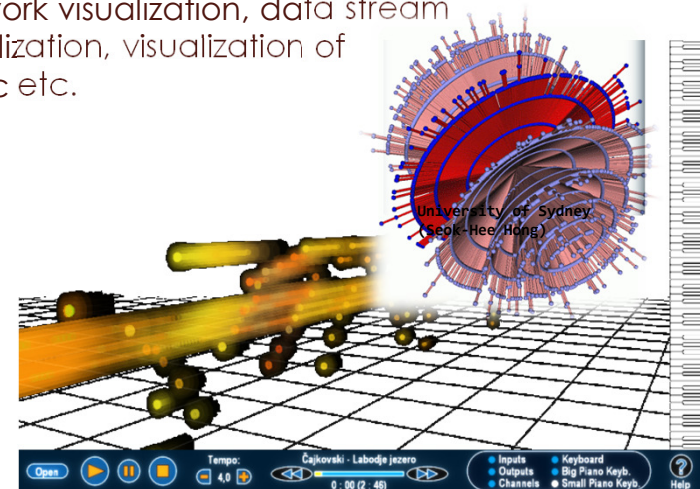
Data **Management**
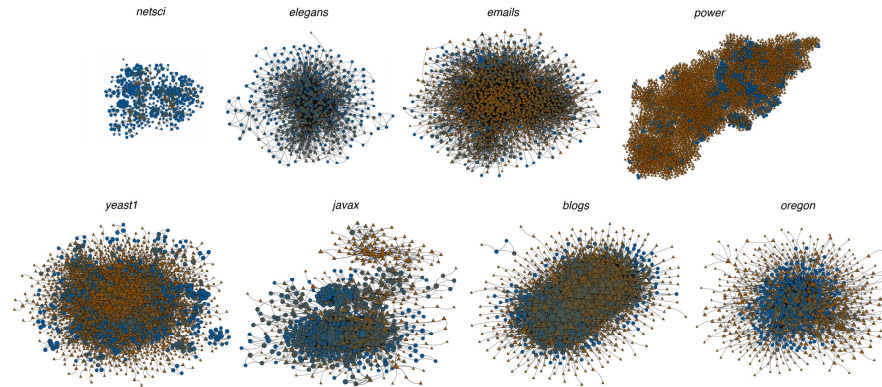Heterogeneous data fusion & integration, EDA, noSQL, business intelligence etc.

Data **Visualization**
Network visualization, data stream visualization, visualization of music etc.
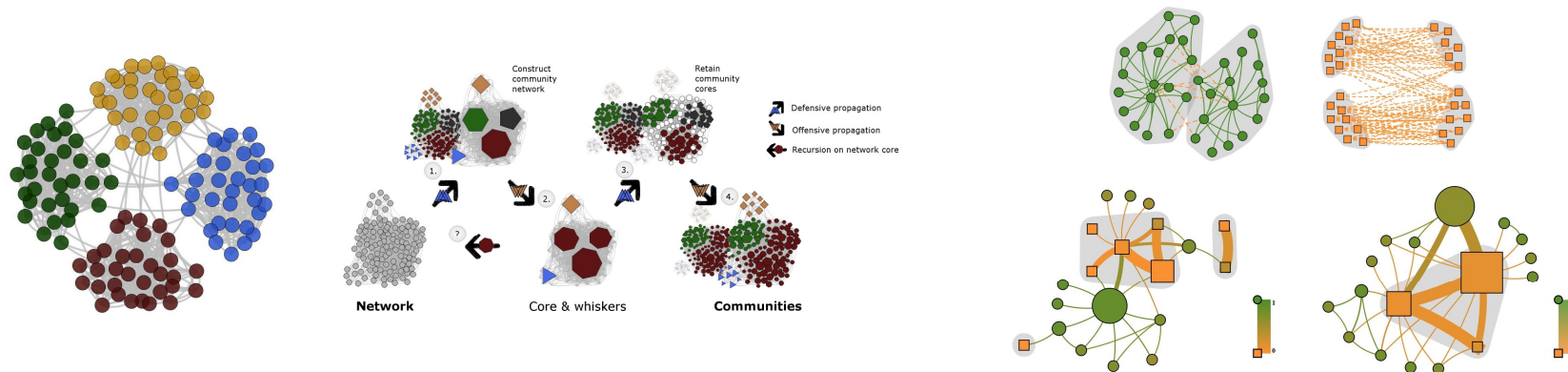
Network analysis, I

- Social, information, biological, technological, economical, etc. networks.

- Common properties of real-world networks [IJU '10]:
  - small-worlds; scale-freeness; community, fractal structure; etc.

- Community structure analy. [Phys. Rev. E, Eur. Phys. J. B, 2011; ACNE '10, NEMO '11]:
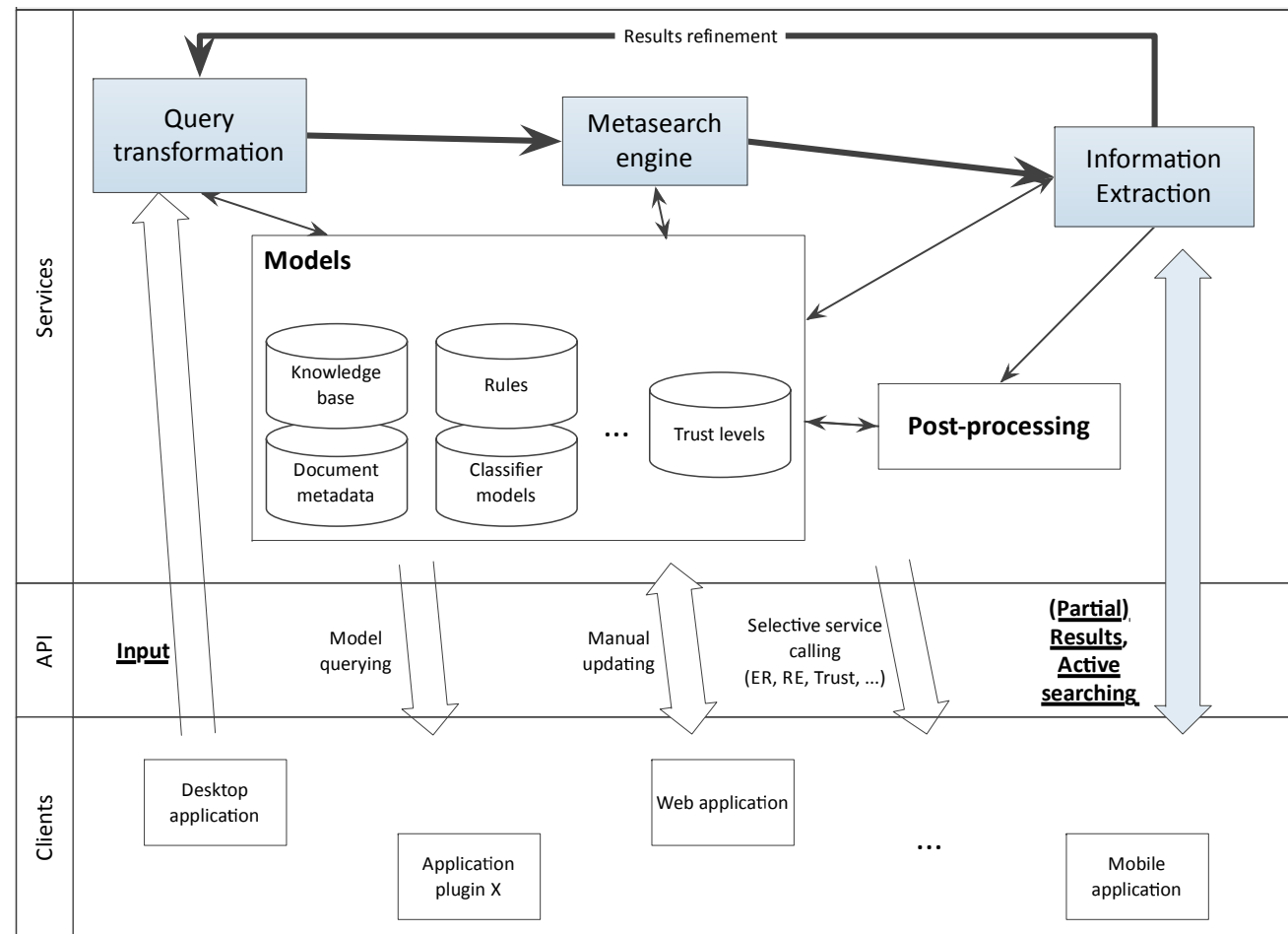
Network analysis, II

- Application to data reduction etc. [sub. Physica A, 2011]:

- Application to software engineering etc. [Physica A, 2011; sub. CAiSE '12]:

$Q = -0.0262$ $Q = 0.5020$

Network mining

- Expert syst. for detection of auto. ins. fraud [Expert Syst. Appl., 2011; DSI '09] :
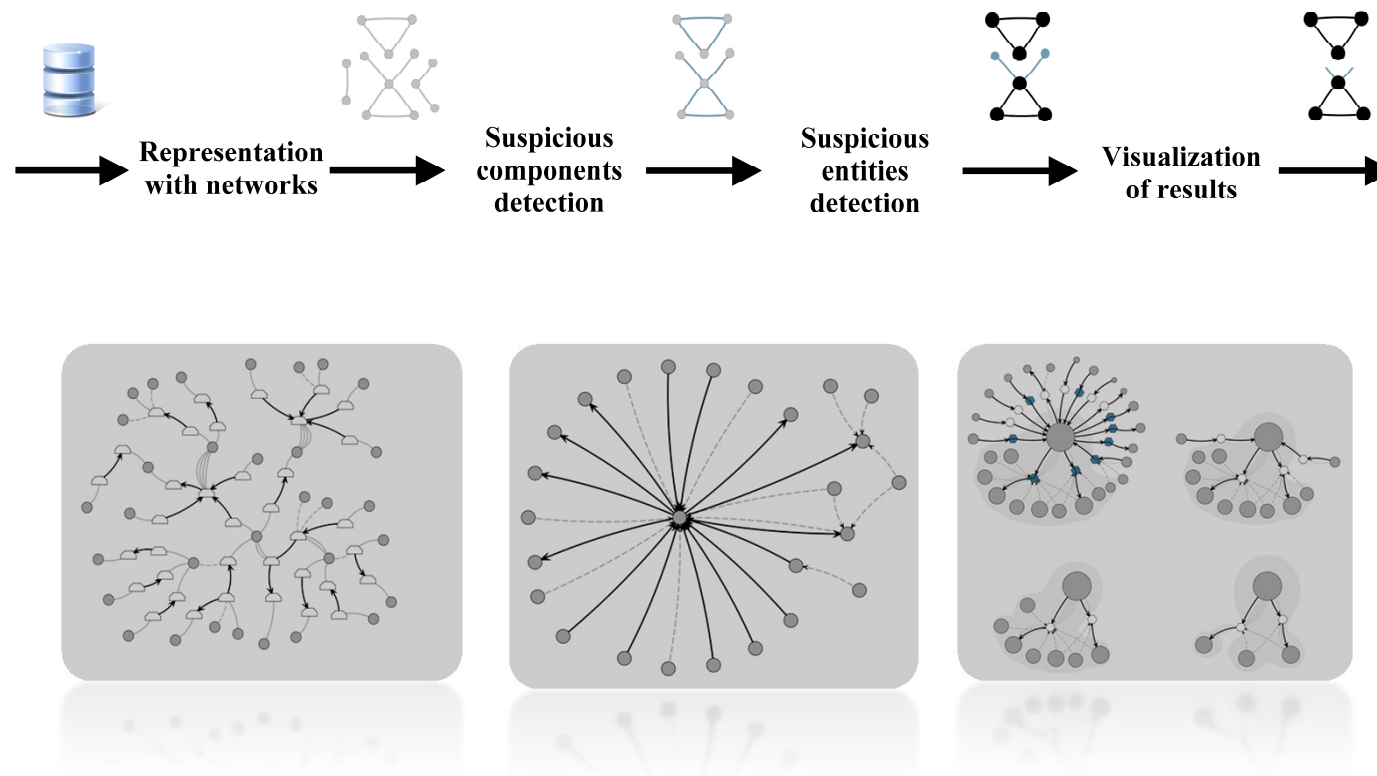
Information retrieval, I

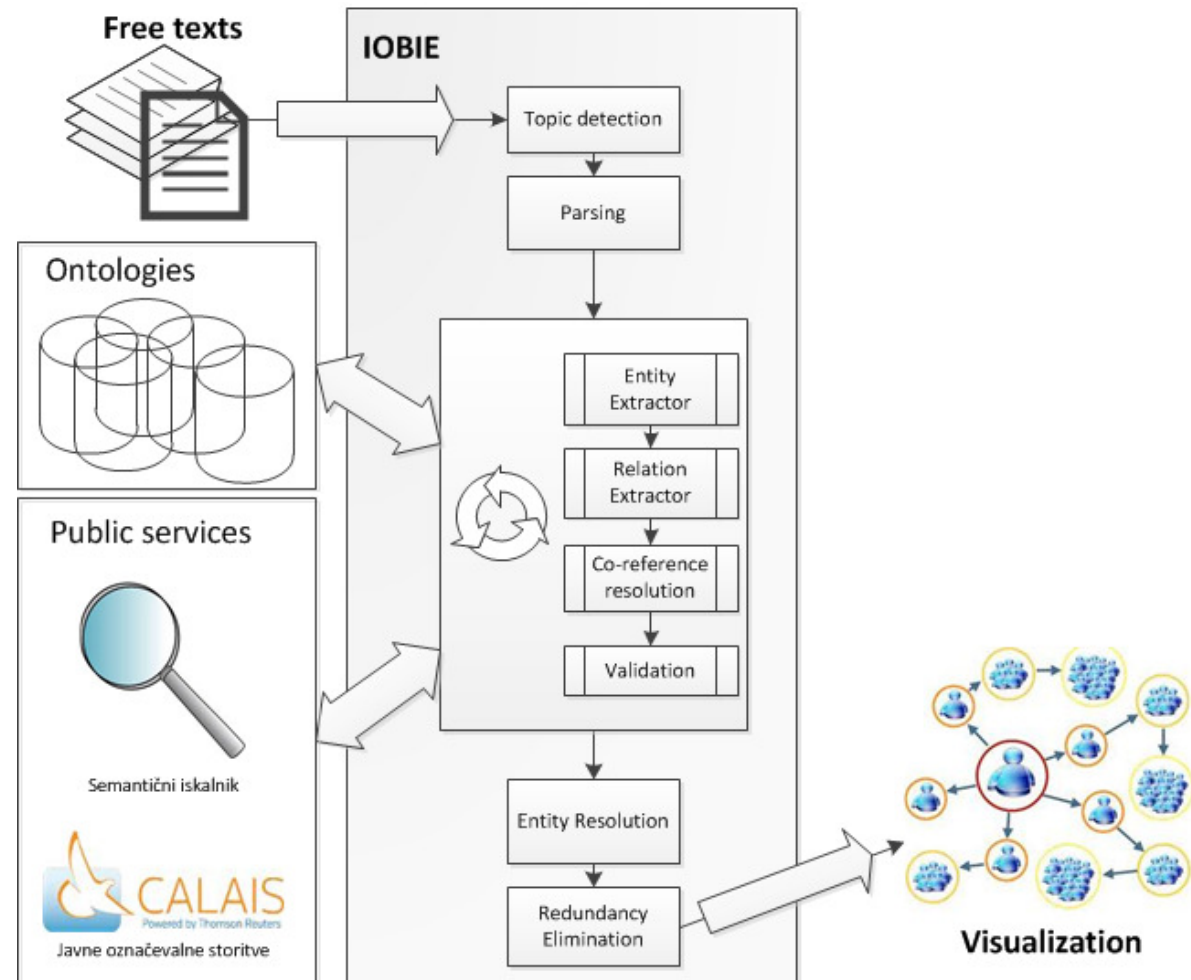- iCORE system [IJU '10] :

Information retrieval, II

- iCORE demo:

http://zitnik.si/temp/icorev2/
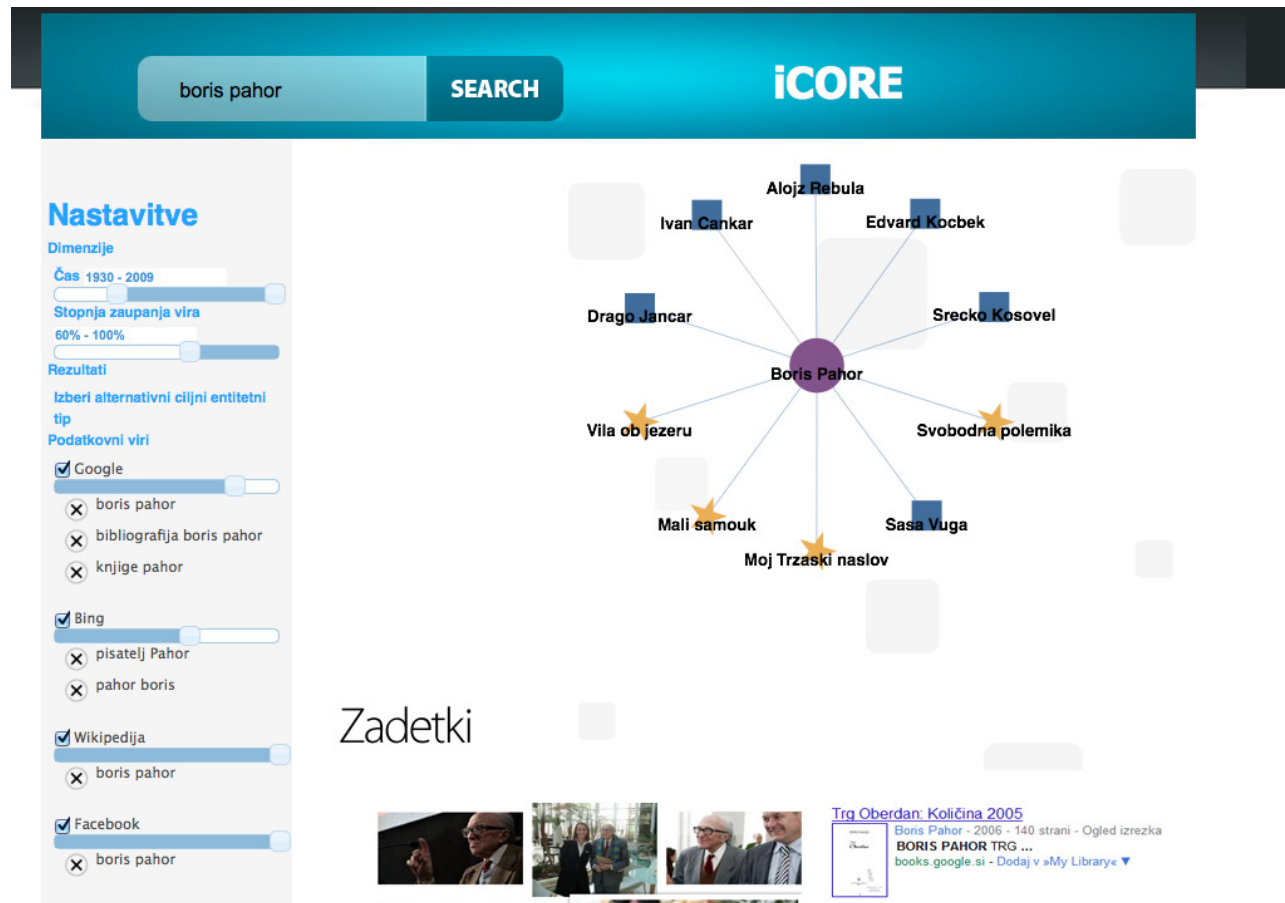
Information extraction, I

- IOBIE system:
  - pluggable framework;
  - ontology-based;
  - ML models (*);
  - collective extraction.

Information extraction, II

- IOBIE example:

Janez Novak(PER) studied at FRI(ORG).
…
As a citizen, he likes Vino(FOOD, LOC).

studiedAt
Janez Novak(PER) studied at FRI(ORG).
…
As a citizen, he(PER) likes Vino(FOOD, LOC).

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New iteration:

studiedAt
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…
As a citizen, he(PER) likes Vino(LOC).

livesIn